M-110 Plus

Service Manual

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SPECIFICATIONS

1. GENERAL

Channels…….…….....400 Ch AM/FM 4W
Frequency Range……..…… ..26.315 to 28.105 MHz
FrequencyControl…….…… ….……PLL
Operating Temperature Range…….…… ……-10° / +55°C
DC Input Voltage……..…….. ..13.2 V DC ±15%
Size……180(L) X 35(H) X 140(D) mm
Weight……..……0.850 kg

2. RECEIVER

Receiving System…….....Dual Conversion Super Heterodyne
Intermediate Frequency…… 1st IF: 10.695 MHz, 2nd IF: 455 MHZ
Sensitivity…….... .0.5 μV for 20 db SINAD in FM mode
Audio Distortion…….... …….Less Than 8% @ 1 KHz
ImageRejection…… ……...65 dB
Adjacent ChannelRejection…… ……...65 dB
Signal/ Noise Ratio……..….45 dB
Current Drain at standby……..325 mA

3. TRANSMITTER

Output Power……..……..….4W @ 13.2 V DC
Modulation……..……FM: 1.8 KHz ±0.2 KHz
Frequency response……...From 400 Hz to 2.5 KHz
Output impedance……RF 50 ohm Unbalance
Signal/ Noise Ratio……..40 dB MIN
Current Drain……1300 mA

OPERATION INSTRUCTIONS

Having properly installed your batteries and hooked-up the antenna, you are now ready to operate your radio for optimum reception and voice transmission.

Turn the power “ON” with ON/OFF switch.

Set the desired channel.

Adjust the squelch control knob to reduce any undesirable background noise when no signal is being received. To do this, select a channel where no signal are present, or wait until signals cease on your channel. Then, rotate the squelch control knob clockwise to a point where the background noise disappears.

> **Note:** When the squelch is set properly, the speaker will remain quiet until a signal is received. In order to receive weak signals, do not set the squelch too high.

Adjust the volume to the desired listening level.

To Transmit

Press and hold the push-to-talk button. Speak slowly and clearly in a normal voice two to three inches from the microphone. A buit-in modulation control circuit will automatically adjust the microphone input level. There is no need to speak loudly.

To Receive

Release the push-to-talk button.

THEORY OF OPERATIONS

TRANSMITTER

A. RF Amplification

The output of double AMP Q301 is fed through tuning IFT L301 and L302 to the base of pre driver AMP Q302. The output is then supplied to RF driver AMP Q303. The output of Q303 is supplied with tuning circuit L304 and C317,C315,C21 and goes to the base of final RF AMP Q304. The output of Q304 is supplied to the antenna through L-C tuning circuit.

B. Circuit for Suppression of Spurious Radiation

The tuning circuit between the output of final AMP Q304 and antenna, 4-stage "PHI" network L308, C324, C325, C327, L311, C337, C333, L312, C328, C334, C338, L313 serves as a spurious radiation suppressor . This network also serves to match the impedance between TX power AMP Q304 and the antenna.

C. Circuit for Limiting Power

After finished all alignment, the constant voltage supply circuit limits the available power 4 W or slightly less. RV1 and corresponding three transistors control supply voltage of RF amplifier and other circuits.

Tune all the trimmer parts for maximum indication of RF power meter and adjust RV1 to make 4 w indication of RF power meter.

The tuning is adjusted so that the actual power is from 3.8 to 4.0 W. There are no other additional controls for adjusting the TX output power.

D. Modulation Control

a. FM

The mic input is fed to mic audio amplifier IC KIA324 which drives modulation varicap diode
D403 in the VCO circuit. RV401 limits the incoming modulation audio levels to inhibit over modulation. While reading the modulation factor on the modulation analyzing equipment, adjust
RV401 shall not exceed +-1.8 KHz/Dev. After 20 dB up from 1.25 KHz/1.2 KHz/Dev. Audio level

b. AM

Modulation signals are filtered with RC network and goes to the audio power AMP IC IC2 to make nominal signal level to achieve wanted modulation. To control incoming audio signal, diode D203 and corresponding ALC circuit limits the modulation shall not exceed +/-80% adjust RV201 +/-80% modulation under 1.0 KHz AF 60% mod plus 20 dB of audio signal.

E. Receiver

CB receiver is dual conversion supper-heterodyne type with the first IF 10.695 MHz and second IF 455 KHz. Receiver is separated two blocks, 1st IF section and 2nd IF section.
The PLL synthesizer supplies first local frequency 16.270 ~ 16.710 MHz.(for EU) and 16.90625 MHz ~ 17.29625 MHz (for UK) With the provided first local frequencies Q105,Q106 mixes the incoming RF signal to generate first IF signal. Mixed signals were filtered with the XF101 (10.695 MHz) crystal filter and other tuning circuits. Output signal of mixer is filtered with CF101 (455 KHz ceramic filter). The 455 KHz signal from the 2nd IF filter was amplified and limits internaly. After amplification the signals fed the quadrature detector loop L104. Then we can see the recovered audio signals on Pin 9 for FM of IC1. With the amplitude of recovered signals, Q108 serves as an audio amplifier. For AM signal Will be pass filter CF1 and induced to Q110, Q111 respective and detected to voice signal by D111.

TROUBLESHOOTING HINTS

Symptom	**Probable Cause**	**Remedy**
Unit does not work at all	• Defective power switch VR102. • Blown fuse. • Broken DC power cord. • Defective IC3.	• Replace • Replace • Replace • Replace
No output from speaker at all	• Defective external speaker jack. • Poor connection on microphone connector • Defective push switch on microphone. • Defective internal speaker. • Defective VR102, IC103 other components.	• Repair or replace • Repair or replace • Repair or replace • Replace • Replace the defective components.
No noise on speaker	• Measure all the voltage of IC102 with voltage chart • Defective squelch circuit components (RV102, VR101, IC102)	• Replace • Replace
Squelch does not work	• Defective VR1, RV2, IC2.	• Replace the defective components. • Re-adjust

No modulation	• Defective microphone. • Poor audio output and defective modulation microphone amplifier components (IC103). • Defective microphone connector components. • Defective ALC circuit D413, D414.	• Replace • Replace the defective components. • Replace • Replace the defective components.
LCD display does not work	• Defective RED wire fuse. • Defective IC3, Q4.	• Replace • Replace
Channel selector does not work	• Defective IC3, SW1,2.	• Replace
EMG CH9.19 does not work	• Defective EMG SW. • Defective IC3.	• Replace • Replace

ALIGNMENT PROCEDURE

Step	Setting	Connection	Adjuster	Adjust for
1	Frequency adjustment MIC : Receive Volume : optional Squelch : optional CH selector : 19 EU CH9 : off	Frequency counter to dummy load (Figure 1).	CT201	27.185MHz±300Hz
2	VCO Voltage adjustment MIC : Receive Volume : optional Squelch : optional CH selector : 00 BAND 00 CH9 : OFF	Connect DC voltmeter between R406, C418 and GND. (Figure 2).	L501	1.5V at RX.

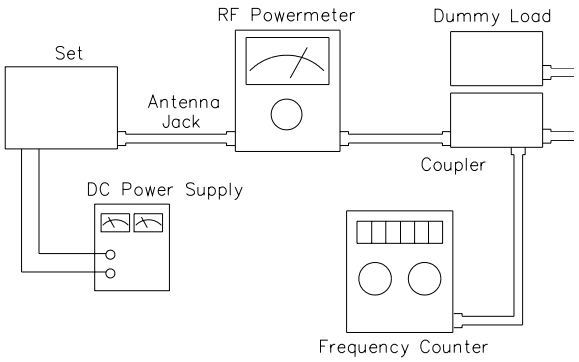


Figure 1

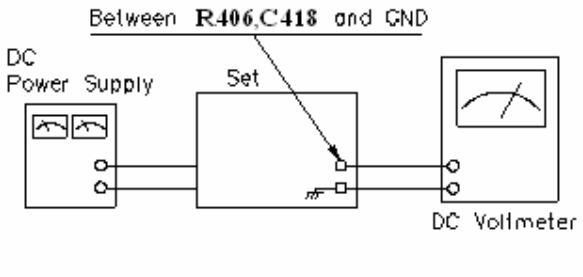


Figure 2

TRANSMITTER SECTION

Test Equipment Required

- RF power meter (RF SSVM)
- 50 ohms dummy load (non-inductive)
- RF attenuator (50 ohms non-inductive)
- Oscilloscope
- Audio generator
- DC power supply (13.2 volt, 3 amp)
- Spectrum analyzer
- Frequency counter
- Coupler

ALIGNMENT PROCEDURE

Step	Setting	Connection	Adjuster	Adjust for
1	RF power stage MIC : Transmit Volume : optional Squelch : optional CH : selector : 19 CH9 : OFF	Connect dummy load and RF power meter to the EXT-ANT jack on the set (Figure 3).	L301 L302 L303	Maximum indication on the power meter (4 watts). If indication is not in 4 watts range, adjust L301, L302.
2	Second harmonic check MIC : Transmit Volume : optional Squelch : optional CH : selector : 19 CH9 : OFF	Connect RF power meter With dummy load to spectrum analyzer through coupler /-40 dB Attenuator to EXT-ANT jack on the set (Figure 4).		At no modulation, compare the level o fundamental frequency to the level of harmonic frequency. Suppression of the 2^{nd} harmonic frequency level must be lower than –60 dB. Check for the other channels.
3	Frequency check MIC : Transmit Volume : optional Squelch : optional CH : selector : 19 CH9 : OFF	Connect dummy load and frequency counter though coupler to RF powermeter. Connect RF powermeter to EXT-ANT jack on the set (Figure 5).	CT201	Be sure that the indication of the transmitter frequency is 27.185MHz±300Hz on the frequency counter.

4	TX power level adjustment Volume : optional Squelch : optional CH : selector : 1 CH9 : OFF	Connect dummy load and oscilloscope through Coupler to RF powermeter connect audio generator to microphone jack (Figure 6).	RV202	Adjust until the 5th bar appears on the channel display LCD.

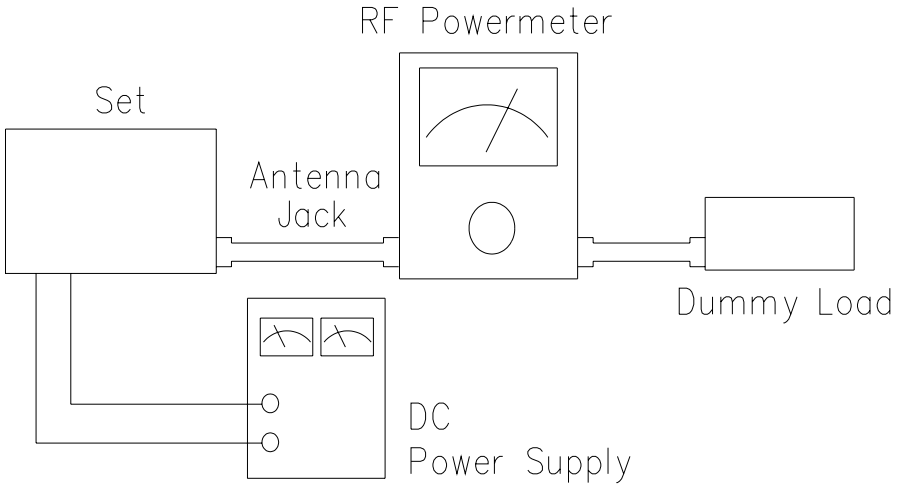


Figure 3

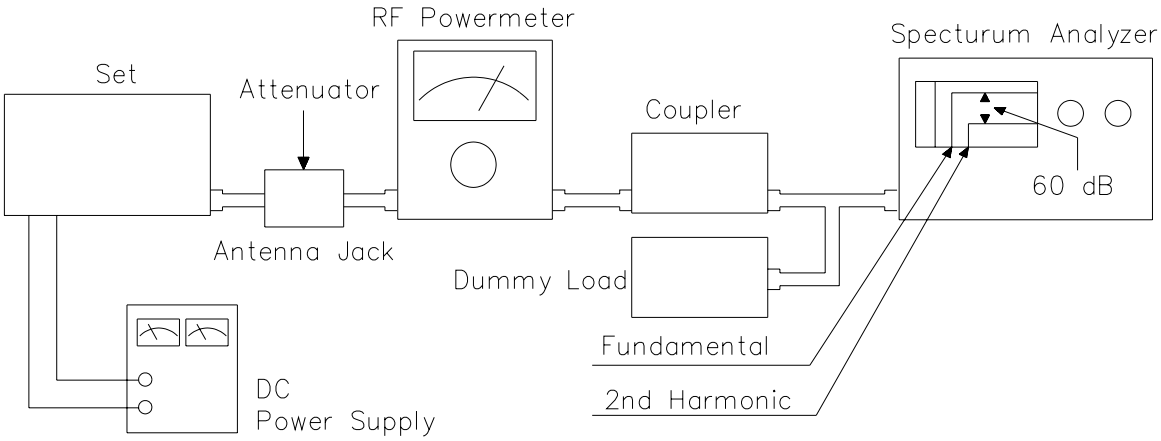


Figure 4

RECEIVER SECTION

Test Equipment Required

- RF Signal generator (RFSG)
- SSVM
- Distortion meter
- DC power supply

ALIGNMENT PROCEDURE

Step	Setting	Connection	Adjuster	Adjust for
1	Audio output adjustment MIC : Receive Volume : Fully clockwise Squelch: Turn to- Counter clockwise CH selector : 19 RF gain : Fully clockwise CH9 : OFF RFSG:27.185 MHz,1kHZ 1μV , 1.2 K Dev.	Connect RF signal generator to EXT-ANT jack. Connect SSVM and distortion meter with 8 ohm dummy load (Figure 7).	L3 L4 L102 L103 L104	Maximum indication on SSVM. Reduce output from RFSG until the audio output becomes about 500mW (2V).

2	Squelch adjustment MIC : Receive Volume : 50mW (2V) Squelch : Clockwise CH selector : 19 RFSG:27.185MHz, 1kHZ 1mV, 1.2K DEV.	Connect RF signal generator to EXT-ANT Jack. Connect SSVM and distortion meter to EXT speaker jack with 8 ohm dummy load (Figure 7).	RV2	Adjust until the audio output appears.

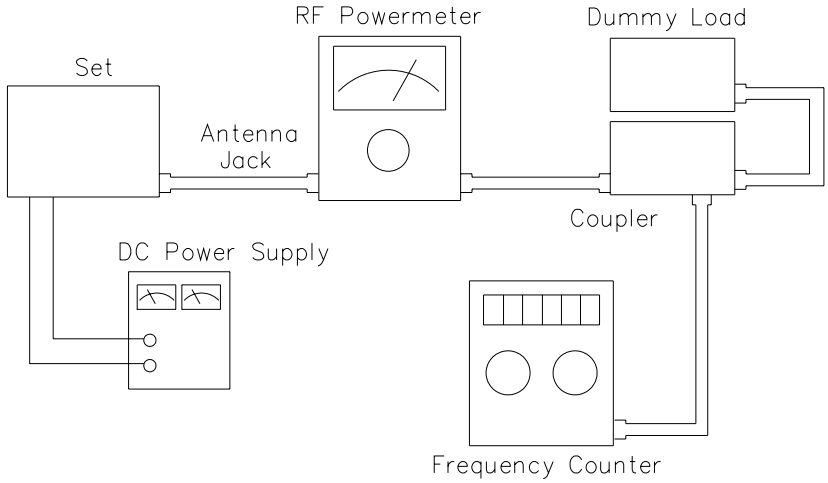


Figure 5

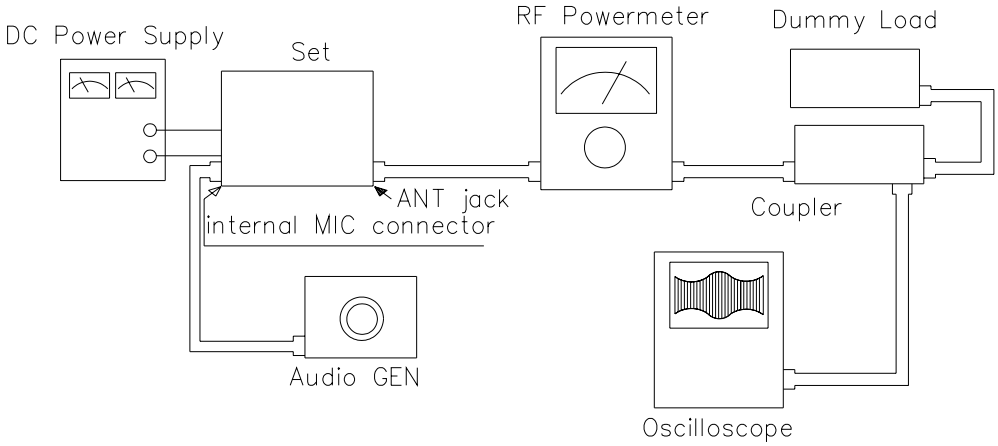


Figure 6

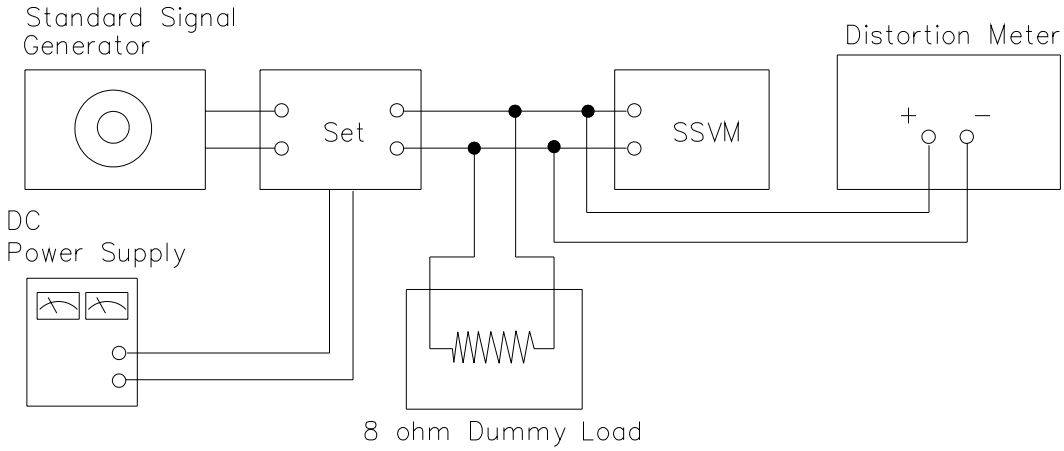
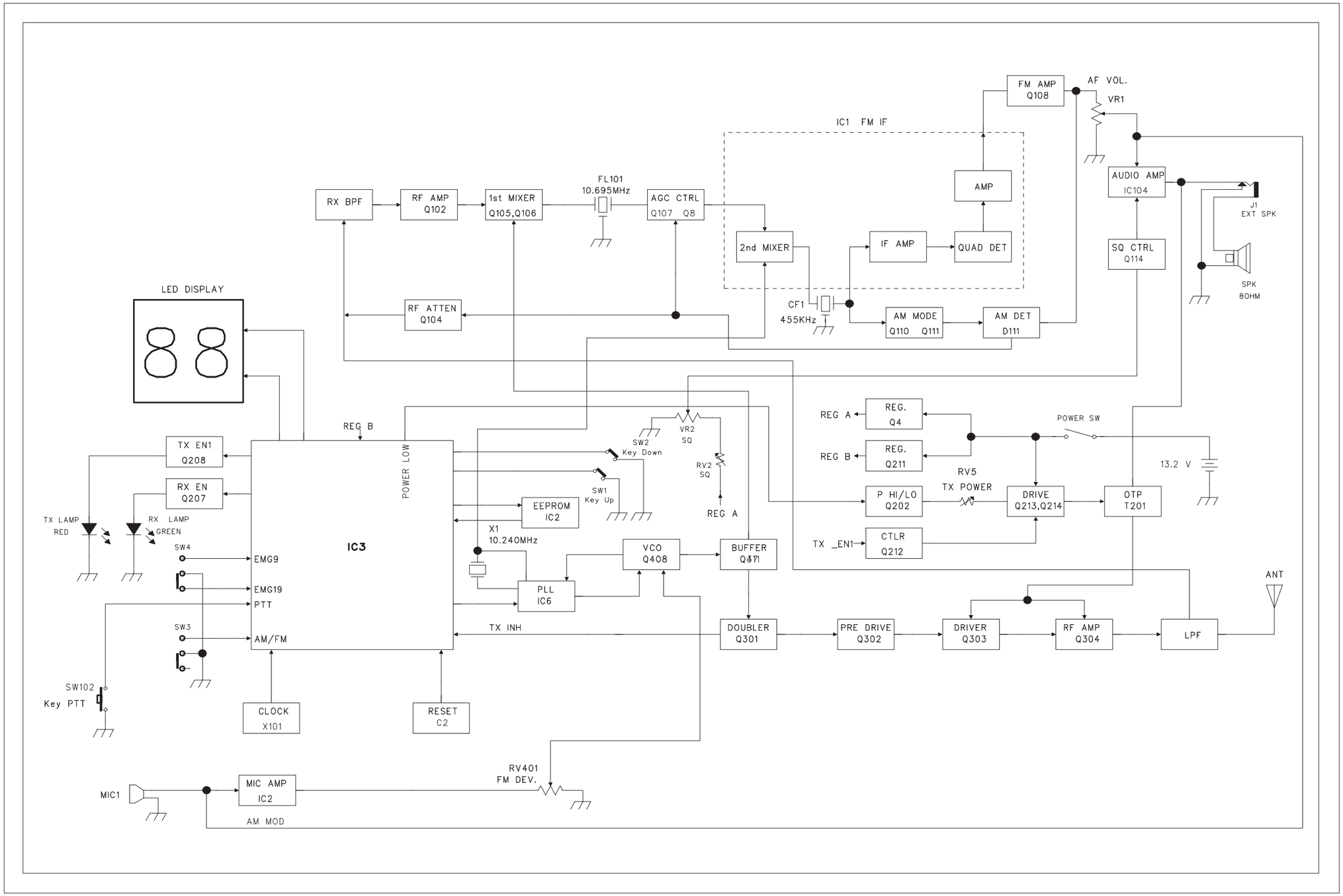


Figure 7



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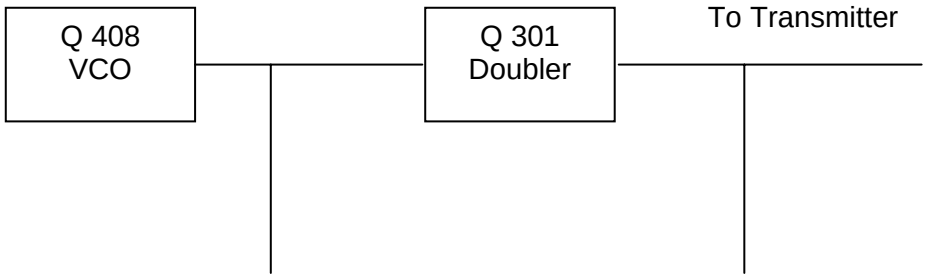
PLL CIRCUIT BLOCK DIAGRAM

1. INTRODUCTION

The frequencies for transmitter and receiver first local frequencies are all derived from a single 10.240 MHz crystal by means of a phase locked loop. The first local oscillator frequencies are 16.270 MHz (CH 1) to 16.710 MHz (CH 40) for EU and 16.90625 MHz (CH 1) to 17.29625 MHz (CH 40) for UK . The second local frequency is fixed at 10.240 MHz to generate second IF 455 KHz. During transmit, The VCO of the PLL operates 13.4825 MHz (CH 1) to 13.7025 MHz (CH 40) for EU ,13.800625 MHz (CH 1) to 13.995625 MHz (CH 40) for UK the VCO frequency gose to the double circuit Q301,L301,L302 which doubles the frequency to generate 26.965 MHz (CH 1) to 27.405 MHz (CH 40) for EU and 27.60125 MHz (CH 1) to 27.99125 MHz (CH 40) for UK



13.4825 MHz (CH 1) EU	26.965 MHz (CH 1)
13.7025 MHz (CH 40) EU	27.405 MHz (CH 40)
13.800625 MHz (CH 1) UK	27.60125 MHz (CH 1)
13.995625 MHz (CH 40) UK	27.99125 MHz (CH 40)

The VCO operating frequency for the receiver is 16.270,16.90625 MHz (CH 1) to 16.710,17.29625 MHz (CH 40) as the first local oscillator, injected through the buffer AMP Q411 into the first fed balanced mixer Q105,Q106

2. BASIC SYNTHESIZER SCHEME

The crystal frequency (10.240MHz) is divided by 1800 times to make 2.5 KHz which is fed to one side of the phase detector. The VCO output is divided by a programmable divider, and fed to other side of the phase detector Pin 11 of IC6. The feedback loop is closed by passing the phase detector output through an active low pass filter and using the output to control the VCO frequency through varicap diode D402

Under locked conditions, both of phase detector input signal must be indential at 2.5 KHz. The VCO frequency is then given by:

$$FVCO / N = 0.0025 \text{ MHz} \quad \text{or} \quad FVCO = 0.0025 \times N \text{ MHz}$$

Since “N” is an integer, the VCO frequency can be stepped up with 2.5 KHz increments. By suitable choice of “N” the desired output frequency can be obtained.

	Channel 1		Channel 40		Function
	N	FVCO	N	FVCO	
Transmit	5393	13.4825	5481	13.7025	EU
Receive	6508	16.2700	6684	16.7100	
Transmit	5520.25	13.800625	5598.25	13.995625	UK
Receive	6762.50	16.90625	6918.5	17.29625	

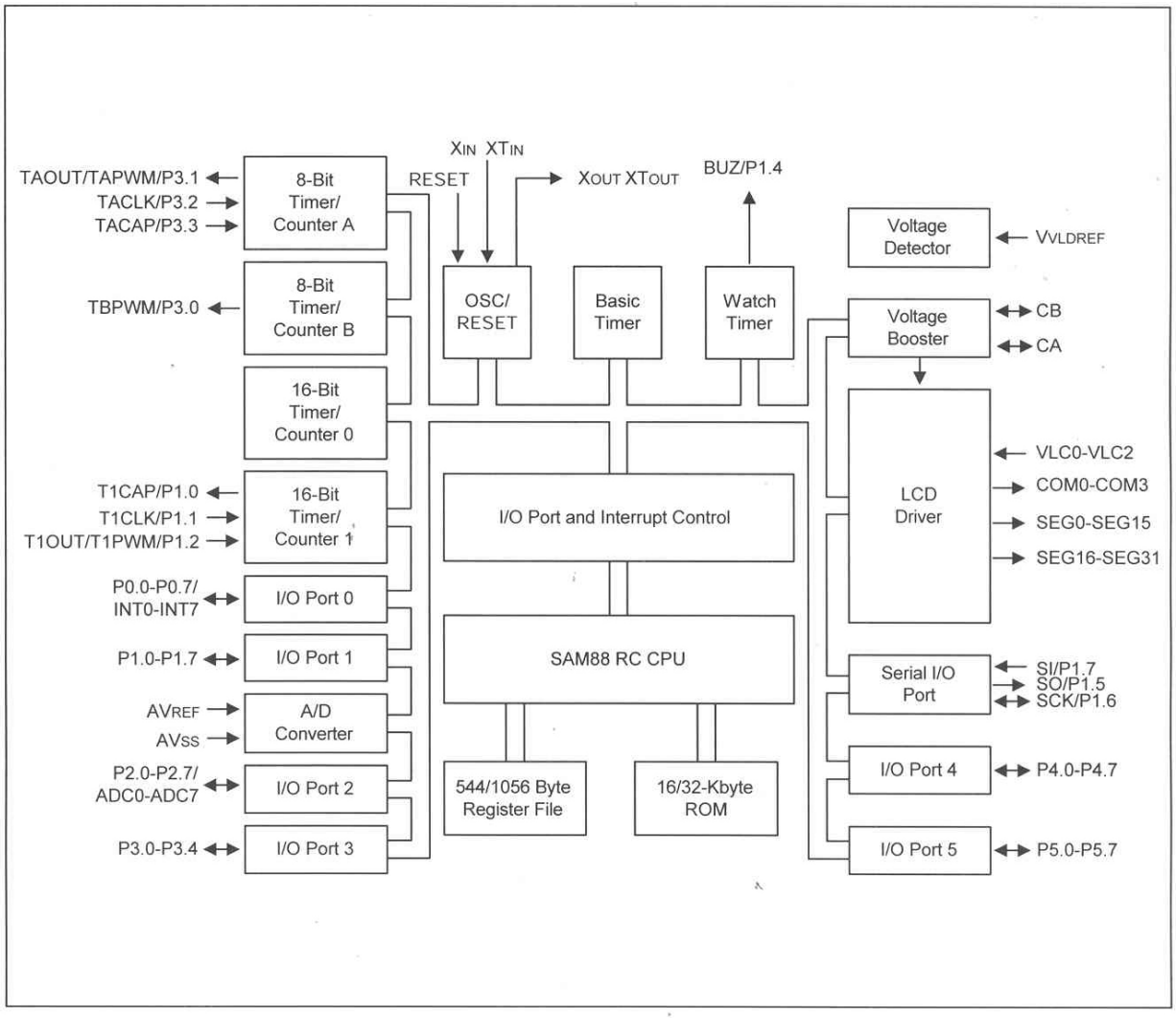
(SEE TABLE FOR OTHER CHANNELS)

The VCO frequency goes to the double circuit, which doubles the incoming signals.

		Double output Frequency
Transmit _____ Transmit _____	CH 1, 13.4825 MHz CH 1, 13.800625 MHz CH 40, 13.7025 MHz CH 40, 13.995625 MHz	26.965 MHz 27.60125 MHz 27.405 MHz 27.99125 MHz

Since all frequencies are obtained from the crystal controlled PLL oscillator, all outputs are coherent with the crystal oscillator frequency and maintaining the same percentage accuracy.

INTERNAL BLOCK DIAGRAM



DIVIDE RATIO, VCO RX/TX FREQUENCIES FOR EACH CHANNEL OF "EU"

Channels	Frequencies (MHz)	RX		TX	
			Frequencies MHz		Frequencies MHz
1	26.965	6508	16.27	5393	13.4825
2	26.975	6512	16.28	5395	13.4875
3	26.985	6516	16.29	5397	13.4925
4	27.005	6524	16.31	5401	13.5025
5	27.015	6528	16.32	5403	13.5075
6	27.025	6532	16.33	5405	13.5125
7	27.035	6536	16.34	5407	13.5175
8	27.055	6544	16.36	5411	13.5275
9	27.065	6548	16.37	5413	13.5325
10	27.075	6552	16.38	5415	13.5375
11	27.085	6505	16.39	5417	13.5425
12	27.105	6512	16.41	5421	13.5525
13	27.115	6516	16.42	5423	13.5575
14	27.125	6524	16.43	5425	13.5626
15	27.135	6528	16.44	5427	13.5675
16	27.155	6532	16.46	5431	13.5775
17	27.165	6536	16.47	5433	13.5825
18	27.175	6544	16.48	5435	13.5875
19	27.185	6548	16.49	5437	13.5925
20	27.205	6552	16.51	5441	13.6025
21	27.215	6608	16.52	5443	13.6075
22	27.225	6612	16.53	5445	13.6125
23	27.255	6624	16.56	5451	13.6275
24	27.235	6616	16.54	5447	13.6175
25	27.245	6620	16.55	5449	13.6225
26	27.265	6628	16.57	5453	13.6325
27	27.275	6632	16.58	5455	13.6375
28	27.285	6636	16.59	5457	14.6425
29	27.295	6640	16.60	5459	13.6475
30	27.305	6644	16.61	5461	13.6525
31	27.315	6648	16.62	5463	13.6575
32	27.325	6652	16.63	5465	13.6625
33	27.335	6656	16.64	5467	13.6675
34	27.345	6660	16.65	5469	13.6725
35	27.355	6664	16.66	5471	13.6775
36	27.365	6668	16.67	5473	13.6825

37	27.375	6672	16.68	5475	13.6875
38	27.385	6676	16.69	5477	13.6925
39	27.395	6680	16.70	5479	13.6975
40	27.405	6684	16.71	5481	13.7025

DIVIDE RATIO, VCO RX/TX FREQUENCIES FOR EACH CHANNEL OF "UK"

Channels	Frequencies (MHz)	RX		TX	
		..	Frequencies MHz	..	Frequencies MHz
1	27.60125	6546.5	16.90625	5412.25	13.800625
2	27.61125	6766.5	16.91625	5522.25	13.805625
3	27.62125	6770.5	16.92625	5524.25	13.810625
4	27.63125	6774.5	16.93625	5526.25	13.815625
5	27.64125	6778.5	16.94625	5528.25	13.820625
6	27.65125	6782.5	16.95625	5530.25	13.825625
7	27.66125	6786.5	16.96625	5532.25	13.830625
8	27.67125	6790.5	16.67625	5534.25	13.835625
9	27.68125	6794.5	16.98625	5536.25	13.840625
10	27.69125	6798.5	16.99625	5538.25	13.845625
11	27.70125	6802.5	17.00625	5540.25	13.850625
12	27.71125	6806.5	17.01625	5542.25	13.855625
13	27.72125	6810.5	17.02625	5544.25	13.860625
14	27.73125	6814.5	17.03625	5546.25	13.865625
15	27.74125	6818.5	17.04625	5548.25	13.870625
16	27.75125	6822.5	17.05625	5550.25	13.875625
17	27.76125	6826.5	17.06625	5552.25	13.880625
18	27.77125	6830.5	17.07625	5554.25	13.885625
19	27.78125	6834.5	17.08625	5556.25	13.890625
20	27.79125	6838.5	17.09625	5558.25	13.895625
21	27.80125	6842.5	17.10625	5560.25	13.900625
22	27.81125	6846.5	17.11625	5562.25	13.905625
23	27.82125	6850.5	17.12625	5564.25	13.910625
24	27.83125	6854.5	17.13625	5566.25	13.915625
25	27.84125	6858.5	17.14625	5568.25	13.920625
26	27.85125	6861.5	17.15625	5570.25	13.925625
27	27.86125	6866.5	17.16625	5572.25	13.930625
28	27.87125	6870.5	17.17625	5574.25	13.935625
29	27.88125	6874.5	17.18625	5576.25	13.940625
30	27.89125	6878.5	17.19625	5578.25	13.945625

31	27.90125	6882.5	17.20625	5580.25	13.950625
32	27.91125	6886.5	17.21625	5582.25	13.955625
33	27.92125	6890.5	17.22625	5584.25	13.960625
34	27.93125	6844.5	17.23625	5586.25	13.965625
35	27.94125	6898.5	17.24625	5588.25	13.970625
36	27.95125	6902.5	17.25625	5590.25	13.975625
37	27.96125	6906.5	17.26625	5592.25	13.980625
38	27.97125	6910.5	17.27625	5594.25	13.985625
39	27.98125	6914.5	17.28625	5596.25	13.990625
40	27.99125	6918.5	17.29625	5598.25	13.995625

3. DESCRIPTIONS OF EACH BLOCK

A. Introduction

The synthesizer is implemented with the following

Components:

PLL IC (IC6)
X-TAL (X901)
VCO, VARICAP DOIDE (D402)

IC3 is a cmos LSI that includes most of PLL block and driver, the Q408, C51, C414, C417, C423 and L501, Varicap diode D402 are clapp oscillator circuit to operate as a VCO of the IC6. Q408 is a switching transistor to connect or disconnect the tuning capacitor in the VCO oscillator tank circuit for transmitter or receiver. Q406 works as a buffer AMP for RX local frequencies (16 MHz) and TX generating frequencies (13 MHz).

B. Reference frequency

The crystal, X901 (10.240 MHz) and other components of IC6 can make a reference frequency oscillator with internal amplifier.

C. VCO

Q408 and surrounding parts are consisting a clapp oscillator works as a VCO of IC6. the VCO can be oscillate over the required of 13.4825 MHz to 17.29625 MHz

D. Phase detector and VCO control

The detector is a digital phase comparator which compares the phase of the reference signal with programmable divider output square waves and develops a series of pulses whose DC level depends on the phase error of each signal.

E. Transmitter/Receiver buffer AMP

Output signal of Q408 is fed into buffer AMP Q411,

F. Transmitter doubler

The output signals of Q411 goes to an amplifier with tuning circuit Q301,L301,L302 which doubles incoming 13 MHz signals.

G. Switching of tuning capacitor in VCO

The VCO circuit must tune with a wide rang of frequencies 13.4825 ~ 13.7025 MHz (EU), 13.800625 ~ 13.995625 MHz (UK) for transmitter and 16.270~16.710 MHz (EU), 16.90625 ~ 17.29625 MHz (UK) for receiver. To comply above rang of VCO, the tuning capacitance should switched for transmission or reception.

H. Receiver local oscillator outputs

First Mixer:

The secondary output signals is injected to the sources of 1st mixer Q105,Q106 in the 1st IF mixer section

Second Mixer:

The output of 10.24 MHz oscillator circuit with X-1 is injected into the IF IC internally. Incoming IF signal and 10.24 MHz are mixed inside the IF IC to extract 2nd IF signal 455 KHz. FM,AM audio signals are recovered with the way of quadrature detector, AM signals are recovered with envelope detector.

4. FREQUENCY STABILITY

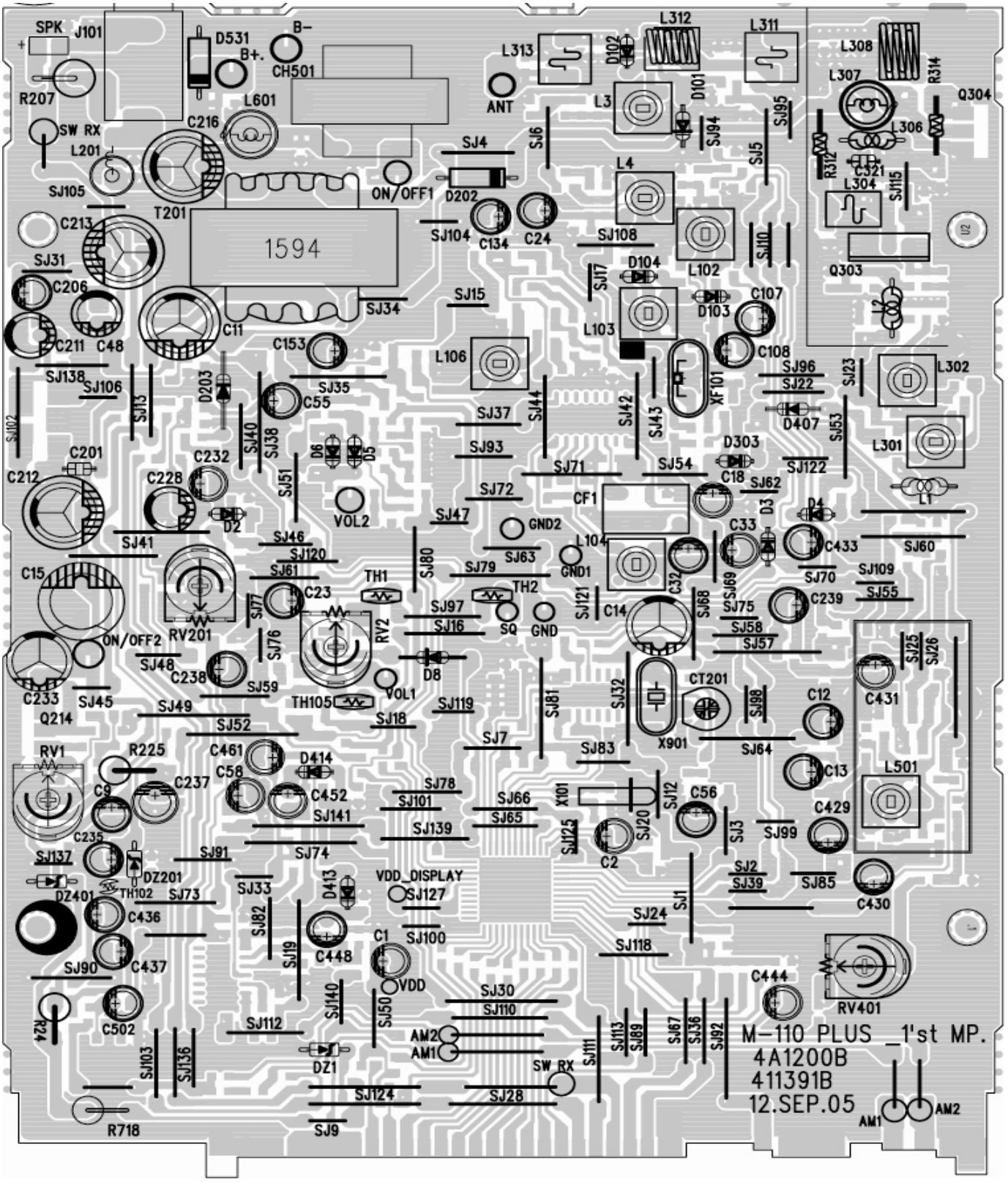
LET : Fo = Crystal oscillator frequency
Fr = Phase detector reference frequency
Fvco = VCO frequency
Ft = Transmit frequency
Then : Fr = Fo/1800
And under locked conditions : Fr = Fvco / N

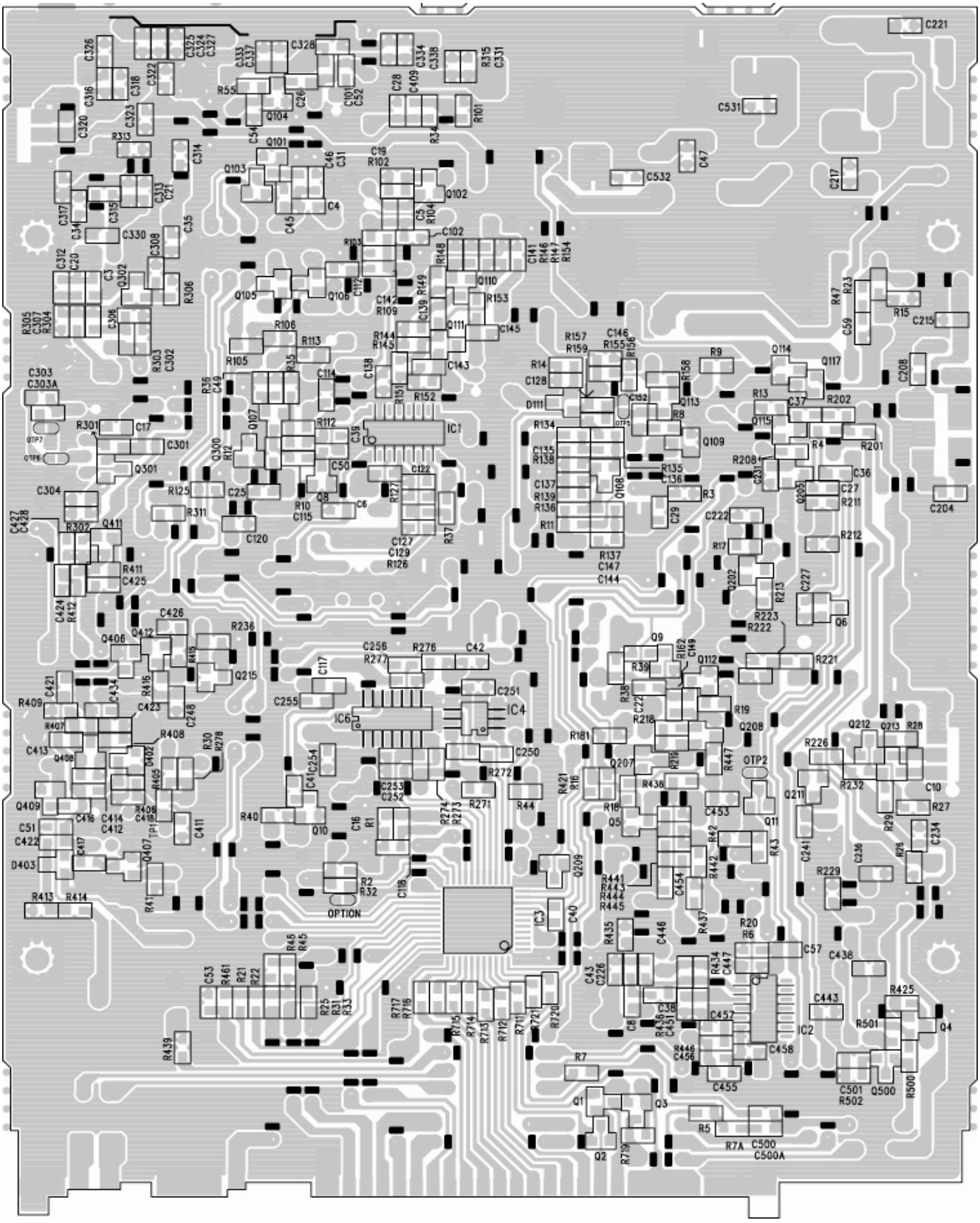
WHERE, “N” is the programmable divider divide ratio.

THEN : Fvco = N X Fr

From which it can be seen, the percentage error in Ft is the same as the percentage error in Fo. The stability of the crystal oscillator is determined primarily by the crystal itself and having lesser deviation by the active and passive components of the oscillator. The choice of crystal and component is such that the required frequency stability is maintained over the required voltage
and temperature rang.

Printed Circuit Board

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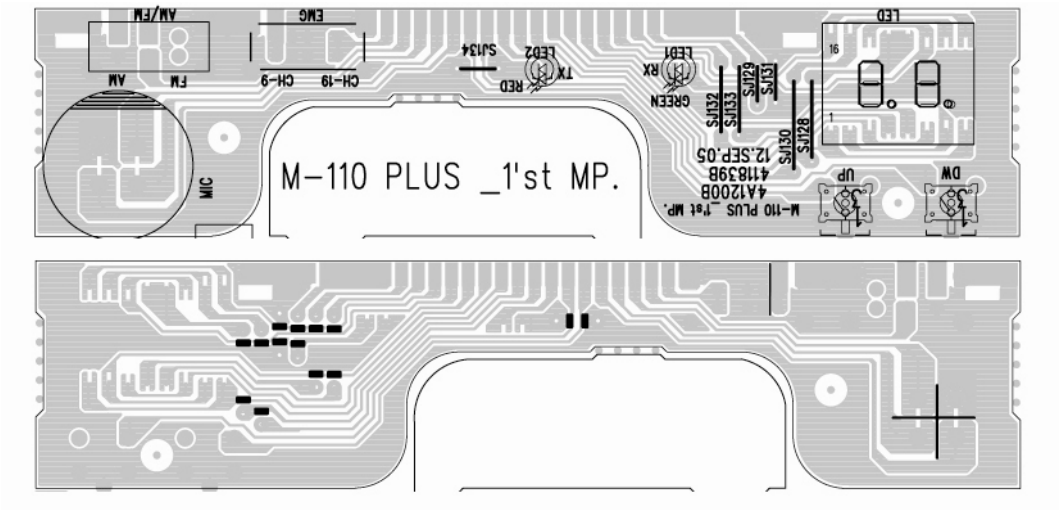


BANDS / FREQUENCY TABLE

Total no. 10 bands are available, as follows :

SPECIFICATION	BAND CODE	BAND
ITALY 40CH AM / FM 4W	01	I
ITALY 36CH AM / FM 4W	02	I2
GERMANY 80CH FM 4W / 12CH AM 1W	03	D
GERMANY 40CH FM 4W / 12CH AM 1W	04	D2
EUROPE 40CH FM 4W / 40CH AM 1W	05	EU
CEPT 40CH FM 4W	06	EC
ENGLAND 40CH FM 4W / UK FREQUENCIES + EC 40CH FM 4W CEPT → display : UK & CE (using AM/FM button)	07	UK
POLAND 40CH AM / FM 4W / POLISH FREQUENCIES – 5KHz	08	PL
SPECIAL BAND A 100CH AM / FM 4W	09	A
SPECIAL BAND B 100CH AM / FM 4W	00	B

BAND 01 ITALY 40CH AM / FM 4W

CH	Frequency (MHz)	Modulation	CH	Frequency (MHz)	Modulation
1	26.965	AM / FM	21	27.215	AM / FM
2	26.975	AM / FM	22	27.225	AM / FM
3	26.985	AM / FM	23	27.255	AM / FM
4	27.005	AM / FM	24	27.235	AM / FM
5	27.015	AM / FM	25	27.245	AM / FM
6	27.025	AM / FM	26	27.265	AM / FM
7	27.035	AM / FM	27	27.275	AM / FM
8	27.055	AM / FM	28	27.285	AM / FM
9	27.065	AM / FM	29	27.295	AM / FM
10	27.075	AM / FM	30	27.305	AM / FM
11	27.085	AM / FM	31	27.315	AM / FM
12	27.105	AM / FM	32	27.325	AM / FM
13	27.115	AM / FM	33	27.335	AM / FM
14	27.125	AM / FM	34	27.345	AM / FM
15	27.135	AM / FM	35	27.355	AM / FM
16	27.155	AM / FM	36	27.365	AM / FM
17	27.165	AM / FM	37	27.375	AM / FM
18	27.175	AM / FM	38	27.385	AM / FM
19	27.185	AM / FM	39	27.395	AM / FM
20	27.205	AM / FM	40	27.405	AM / FM

BAND 02 ITALY 36CH AM / FM 4W

CH	Frequency (MHz)	Modulation	CH	Frequency (MHz)	Modulation
1	26.965	AM / FM	19	27.185	AM / FM
2	26.975	AM / FM	20	27.205	AM / FM
3	26.985	AM / FM	21	27.215	AM / FM
4	27.005	AM / FM	22	27.225	AM / FM
5	27.015	AM / FM	23	27.255	AM / FM
6	27.025	AM / FM	24	27.245	AM / FM
7	27.035	AM / FM	25	27.265	AM / FM
8	27.055	AM / FM	26	26.875	AM / FM
9	27.065	AM / FM	27	26.885	AM / FM
10	27.075	AM / FM	28	26.895	AM / FM
11	27.085	AM / FM	29	26.905	AM / FM
12	27.105	AM / FM	30	26.915	AM / FM
13	27.115	AM / FM	31	26.925	AM / FM
14	27.125	AM / FM	32	26.935	AM / FM
15	27.135	AM / FM	33	26.945	AM / FM
16	27.155	AM / FM	34	26.955	AM / FM
17	27.165	AM / FM	35	26.855	AM / FM
18	27.175	AM / FM	36	26.865	AM / FM

BAND 03 GERMANY 80CH FM 4W / 12CH AM 1W

CH	Frequency (MHz)	Modulation
1	26.965	FM
2	26.975	FM
3	26.985	FM
4	27.005	AM / FM
5	27.015	AM / FM
6	27.025	AM / FM
7	27.035	AM / FM
8	27.055	AM / FM
9	27.065	AM / FM
10	27.075	AM / FM
11	27.085	AM / FM
12	27.105	AM / FM
13	27.115	AM / FM
14	27.125	AM / FM
15	27.135	AM / FM
16	27.155	FM
17	27.165	FM
18	27.175	FM
19	27.185	FM
20	27.205	FM
21	27.215	FM
22	27.225	FM
23	27.255	FM
24	27.235	FM
25	27.245	FM
26	27.265	FM
27	27.275	FM
28	27.285	FM
29	27.295	FM
30	27.305	FM
31	27.315	FM
32	27.325	FM
33	27.335	FM
34	27.345	FM
35	27.355	FM
36	27.365	FM
37	27.375	FM
38	27.385	FM
39	27.395	FM
40	27.405	FM

CH	Frequency (MHz)	Modulation
41	26.565	FM
42	26.575	FM
43	26.585	FM
44	26.595	FM
45	26.605	FM
46	26.615	FM
47	26.625	FM
48	26.635	FM
49	26.645	FM
50	26.655	FM
51	26.665	FM
52	26.675	FM
53	26.685	FM
54	26.695	FM
55	26.705	FM
56	26.715	FM
57	26.725	FM
58	26.735	FM
59	26.745	FM
60	26.755	FM
61	26.765	FM
62	26.775	FM
63	26.785	FM
64	26.795	FM
65	26.805	FM
66	26.815	FM
67	26.825	FM
68	26.835	FM
69	26.845	FM
70	26.855	FM
71	26.865	FM
72	26.875	FM
73	26.885	FM
74	26.895	FM
75	26.905	FM
76	26.915	FM
77	26.925	FM
78	26.935	FM
79	26.945	FM
80	26.955	FM

BAND 04 GERMANY 40CH FM 4W / 12CH AM 1W

CH	Frequency (MHz)	Modulation	CH	Frequency (MHz)	Modulation
1	26.965	FM	21	27.215	FM
2	26.975	FM	22	27.225	FM
3	26.985	FM	23	27.255	FM
4	27.005	AM / FM	24	27.235	FM
5	27.015	AM / FM	25	27.245	FM
6	27.025	AM / FM	26	27.265	FM
7	27.035	AM / FM	27	27.275	FM
8	27.055	AM / FM	28	27.285	FM
9	27.065	AM / FM	29	27.295	FM
10	27.075	AM / FM	30	27.305	FM
11	27.085	AM / FM	31	27.315	FM
12	27.105	AM / FM	32	27.325	FM
13	27.115	AM / FM	33	27.335	FM
14	27.125	AM / FM	34	27.345	FM
15	27.135	AM / FM	35	27.355	FM
16	27.155	FM	36	27.365	FM
17	27.165	FM	37	27.375	FM
18	27.175	FM	38	27.385	FM
19	27.185	FM	39	27.395	FM
20	27.205	FM	40	27.405	FM

BAND 05 EUROPE 40CH FM 4W / 40CH AM 1W

CH	Frequency (MHz)	Modulation	CH	Frequency (MHz)	Modulation
1	26.965	AM / FM	21	27.215	AM / FM
2	26.975	AM / FM	22	27.225	AM / FM
3	26.985	AM / FM	23	27.255	AM / FM
4	27.005	AM / FM	24	27.235	AM / FM
5	27.015	AM / FM	25	27.245	AM / FM
6	27.025	AM / FM	26	27.265	AM / FM
7	27.035	AM / FM	27	27.275	AM / FM
8	27.055	AM / FM	28	27.285	AM / FM
9	27.065	AM / FM	29	27.295	AM / FM
10	27.075	AM / FM	30	27.305	AM / FM
11	27.085	AM / FM	31	27.315	AM / FM
12	27.105	AM / FM	32	27.325	AM / FM
13	27.115	AM / FM	33	27.335	AM / FM
14	27.125	AM / FM	34	27.345	AM / FM
15	27.135	AM / FM	35	27.355	AM / FM
16	27.155	AM / FM	36	27.365	AM / FM
17	27.165	AM / FM	37	27.375	AM / FM
18	27.175	AM / FM	38	27.385	AM / FM
19	27.185	AM / FM	39	27.395	AM / FM
20	27.205	AM / FM	40	27.405	AM / FM

BAND 06 CEPT 40CH FM 4W

CH	Frequency (MHz)	Modulation	CH	Frequency (MHz)	Modulation
1	26.965	FM	21	27.215	FM
2	26.975	FM	22	27.225	FM
3	26.985	FM	23	27.255	FM
4	27.005	FM	24	27.235	FM
5	27.015	FM	25	27.245	FM
6	27.025	FM	26	27.265	FM
7	27.035	FM	27	27.275	FM
8	27.055	FM	28	27.285	FM
9	27.065	FM	29	27.295	FM
10	27.075	FM	30	27.305	FM
11	27.085	FM	31	27.315	FM
12	27.105	FM	32	27.325	FM
13	27.115	FM	33	27.335	FM
14	27.125	FM	34	27.345	FM
15	27.135	FM	35	27.355	FM
16	27.155	FM	36	27.365	FM
17	27.165	FM	37	27.375	FM
18	27.175	FM	38	27.385	FM
19	27.185	FM	39	27.395	FM
20	27.205	FM	40	27.405	FM

BAND 07 ENGLAND 40CH FM 4W / UK FREQUENCIES + EC 40CH FM 4W CEPT

CH	Frequency (MHz)	Modulation
1	27.60125	FM
2	27.61125	FM
3	27.62125	FM
4	27.63125	FM
5	27.64125	FM
6	27.65125	FM
7	27.66125	FM
8	27.67125	FM
9	27.68125	FM
10	27.69125	FM
11	27.70125	FM
12	27.71125	FM
13	27.72125	FM
14	27.73125	FM
15	27.74125	FM
16	27.75125	FM
17	27.76125	FM
18	27.77125	FM
19	27.78125	FM
20	27.79125	FM
21	27.80125	FM
22	27.81125	FM
23	27.82125	FM
24	27.83125	FM
25	27.84125	FM
26	27.85125	FM
27	27.86125	FM
28	27.87125	FM
29	27.88125	FM
30	27.89125	FM
31	27.90125	FM
32	27.91125	FM
33	27.92125	FM
34	27.93125	FM
35	27.94125	FM
36	27.95125	FM
37	27.96125	FM
38	27.97125	FM
39	27.98125	FM
40	27.99125	FM

CH	Frequency (MHz)	Modulation
1	26.965	FM
2	26.975	FM
3	26.985	FM
4	27.005	FM
5	27.015	FM
6	27.025	FM
7	27.035	FM
8	27.055	FM
9	27.065	FM
10	27.075	FM
11	27.085	FM
12	27.105	FM
13	27.115	FM
14	27.125	FM
15	27.135	FM
16	27.155	FM
17	27.165	FM
18	27.175	FM
19	27.185	FM
20	27.205	FM
21	27.215	FM
22	27.225	FM
23	27.255	FM
24	27.235	FM
25	27.245	FM
26	27.265	FM
27	27.275	FM
28	27.285	FM
29	27.295	FM
30	27.305	FM
31	27.315	FM
32	27.325	FM
33	27.335	FM
34	27.345	FM
35	27.355	FM
36	27.365	FM
37	27.375	FM
38	27.385	FM
39	27.395	FM
40	27.405	FM

BAND 08 POLAND 40CH AM / FM 4W / POLISH FREQUENCIES –5KHz

CH	Frequency (MHz)	Modulation	CH	Frequency (MHz)	Modulation
1	26.960	AM / FM	21	27.210	AM / FM
2	26.970	AM / FM	22	27.220	AM / FM
3	26.980	AM / FM	23	27.250	AM / FM
4	27.000	AM / FM	24	27.230	AM / FM
5	27.010	AM / FM	25	27.240	AM / FM
6	27.020	AM / FM	26	27.260	AM / FM
7	27.030	AM / FM	27	27.270	AM / FM
8	27.050	AM / FM	28	27.280	AM / FM
9	27.060	AM / FM	29	27.290	AM / FM
10	27.070	AM / FM	30	27.300	AM / FM
11	27.080	AM / FM	31	27.310	AM / FM
12	27.100	AM / FM	32	27.320	AM / FM
13	27.110	AM / FM	33	27.330	AM / FM
14	27.120	AM / FM	34	27.340	AM / FM
15	27.130	AM / FM	35	27.350	AM / FM
16	27.150	AM / FM	36	27.360	AM / FM
17	27.160	AM / FM	37	27.370	AM / FM
18	27.170	AM / FM	38	27.380	AM / FM
19	27.180	AM / FM	39	27.390	AM / FM
20	27.200	AM / FM	40	27.400	AM / FM

BAND 09 SPECIAL BAND A 100CH AM / FM 4W

CH	Frequency (MHz)	Modulation	CH	Frequency (MHz)	Modulation
1	26.965	AM / FM	51	27.535	AM / FM
2	26.975	AM / FM	52	27.555	AM / FM
3	26.985	AM / FM	53	27.565	AM / FM
4	27.005	AM / FM	54	27.575	AM / FM
5	27.015	AM / FM	55	27.585	AM / FM
6	27.025	AM / FM	56	27.605	AM / FM
7	27.035	AM / FM	57	27.615	AM / FM
8	27.055	AM / FM	58	27.625	AM / FM
9	27.065	AM / FM	59	27.635	AM / FM
10	27.075	AM / FM	60	27.655	AM / FM
11	27.085	AM / FM	61	27.665	AM / FM
12	27.105	AM / FM	62	27.675	AM / FM
13	27.115	AM / FM	63	27.705	AM / FM
14	27.125	AM / FM	64	27.685	AM / FM
15	27.135	AM / FM	65	27.695	AM / FM
16	27.155	AM / FM	66	27.715	AM / FM
17	27.165	AM / FM	67	27.725	AM / FM
18	27.175	AM / FM	68	27.735	AM / FM
19	27.185	AM / FM	69	27.745	AM / FM
20	27.205	AM / FM	70	27.755	AM / FM
21	27.215	AM / FM	71	27.765	AM / FM
22	27.225	AM / FM	72	27.775	AM / FM
23	27.255	AM / FM	73	27.785	AM / FM
24	27.235	AM / FM	74	27.795	AM / FM
25	27.245	AM / FM	75	27.805	AM / FM
26	27.265	AM / FM	76	27.815	AM / FM
27	27.275	AM / FM	77	27.825	AM / FM
28	27.285	AM / FM	78	27.835	AM / FM
29	27.295	AM / FM	79	27.845	AM / FM
30	27.305	AM / FM	80	27.855	AM / FM
31	27.315	AM / FM	81	27.865	AM / FM
32	27.325	AM / FM	82	27.875	AM / FM
33	27.335	AM / FM	83	27.885	AM / FM
34	27.345	AM / FM	84	27.905	AM / FM
35	27.355	AM / FM	85	27.915	AM / FM
36	27.365	AM / FM	86	27.925	AM / FM
37	27.375	AM / FM	87	27.935	AM / FM
38	27.385	AM / FM	88	27.955	AM / FM
39	27.395	AM / FM	89	27.965	AM / FM
40	27.405	AM / FM	90	27.975	AM / FM
41	27.415	AM / FM	91	27.985	AM / FM
42	27.425	AM / FM	92	28.005	AM / FM
43	27.435	AM / FM	93	28.015	AM / FM
44	27.455	AM / FM	94	28.025	AM / FM
45	27.465	AM / FM	95	28.035	AM / FM
46	27.475	AM / FM	96	28.055	AM / FM
47	27.485	AM / FM	97	28.065	AM / FM
48	27.505	AM / FM	98	28.075	AM / FM
49	27.515	AM / FM	99	28.085	AM / FM
50	27.525	AM / FM	00	28.105	AM / FM

BAND 00 SPECIAL BAND B 100CH AM / FM 4W

CH	Frequency (MHz)	Modulation	CH	Frequency (MHz)	Modulation
1	26.965	AM / FM	51	26.855	AM / FM
2	26.975	AM / FM	52	26.845	AM / FM
3	26.985	AM / FM	53	26.835	AM / FM
4	27.005	AM / FM	54	26.825	AM / FM
5	27.015	AM / FM	55	26.815	AM / FM
6	27.025	AM / FM	56	26.795	AM / FM
7	27.035	AM / FM	57	26.785	AM / FM
8	27.055	AM / FM	58	26.805	AM / FM
9	27.065	AM / FM	59	26.775	AM / FM
10	27.075	AM / FM	60	26.765	AM / FM
11	27.085	AM / FM	61	26.755	AM / FM
12	27.105	AM / FM	62	26.735	AM / FM
13	27.115	AM / FM	63	26.725	AM / FM
14	27.125	AM / FM	64	26.715	AM / FM
15	27.135	AM / FM	65	26.705	AM / FM
16	27.155	AM / FM	66	26.685	AM / FM
17	27.165	AM / FM	67	26.675	AM / FM
18	27.175	AM / FM	68	26.665	AM / FM
19	27.185	AM / FM	69	26.655	AM / FM
20	27.205	AM / FM	70	26.635	AM / FM
21	27.215	AM / FM	71	26.625	AM / FM
22	27.225	AM / FM	72	26.615	AM / FM
23	27.255	AM / FM	73	26.605	AM / FM
24	27.235	AM / FM	74	26.585	AM / FM
25	27.245	AM / FM	75	26.575	AM / FM
26	27.265	AM / FM	76	26.565	AM / FM
27	27.275	AM / FM	77	26.555	AM / FM
28	27.285	AM / FM	78	26.535	AM / FM
29	27.295	AM / FM	79	26.525	AM / FM
30	27.305	AM / FM	80	26.515	AM / FM
31	27.315	AM / FM	81	26.505	AM / FM
32	27.325	AM / FM	82	26.495	AM / FM
33	27.335	AM / FM	83	26.485	AM / FM
34	27.345	AM / FM	84	26.475	AM / FM
35	27.355	AM / FM	85	26.465	AM / FM
36	27.365	AM / FM	86	26.455	AM / FM
37	27.375	AM / FM	87	26.445	AM / FM
38	27.385	AM / FM	88	26.435	AM / FM
39	27.395	AM / FM	89	26.425	AM / FM
40	27.405	AM / FM	90	26.415	AM / FM
41	26.955	AM / FM	91	26.405	AM / FM
42	26.945	AM / FM	92	26.395	AM / FM
43	26.935	AM / FM	93	26.385	AM / FM
44	26.925	AM / FM	94	26.375	AM / FM
45	26.915	AM / FM	95	26.365	AM / FM
46	26.905	AM / FM	96	26.345	AM / FM
47	26.895	AM / FM	97	26.335	AM / FM
48	26.885	AM / FM	98	26.355	AM / FM
49	26.875	AM / FM	99	26.325	AM / FM
50	26.865	AM / FM	00	26.315	AM / FM

PARTS LIST

No.	Part No.	Part name & Description	Q'ty	Ref.
1	533-94C-A	COVER ASS'Y	1	
2	420-128-4Z	SPEAKER NP-250-2 8 OHM 2W 66MM	1	SPK
3	533-94E-A	ESCUTCHEON ASS'Y	1	
4	251-027-7X	LED LAMP LTL-1CHG GREEN	1	LED1
5	251-052-9Z	LED LAMP LTL-16KE RED 5V 100MW	1	LED2
6	252-016-2	LED DISPLAY LTD-482LLC GRN	1	LCD1
7	436-059-7Z	SW TACT TM115AP	2	SW1.2
8	533-94F-A	FRONT BODY ASS'Y	1	
9	131-510-9X	DISK CERAMIC 150PF NPO K% 50V	1	C335
10	133-311-0	DISK CERAMIC 330PF NPO331K 50V	1	C339
11	202-066-2	TRANSISTOR KTB1367	1	Q214
12	204-010-1	TRANSISTOR 2SC2078(E)	1	Q304
13	221-889-8	AUDIO POWER AMPLIFIEUTC TDA2003(V) (TO-220-5)	1	IC104
14	421-046-7	CONNECTOR CH-239(A) SW-1229	1	J103
15	421-559-4A	CONNECTOR SCN-16-4 PCB(R)	1	CON1
16	440-020-4	MICA 0.1T:15X13 MICA FOR TR	1	MICA
17	504-734-Z	POWER CORD ASS'Y UL 1015 #20 150MM FUSE HOLDER	1	
18	509-110	6.5T SPRING COIL ASS6.5T3.4X.55:M9D3.7X6	1	L314
19	310-809-1	COIL SPRING 3.4X0.55X6.5T:R	1	
20	321-053-2	CORE 1108-KA-058 M9DTH3.7X6	1	
21	533-94L-PA	LCD PCB ASS'Y	1	
22	533-94M-A	MIC ASS'Y	1	
23	130-A17-6Y	CHIP CERAMIC 0.001UF GRM40 X7R102K 50V PT	1	C44
24	420-205-9Y	MIC CONDENSER KUC4023-010010	1	C-MIC
25	420-349-6	CORD CURLED 3CON 1SH 300MM BLK	1	MIC CORD
26	421-038-0	CONNECTOR PLUG SW-1461	1	CON2
27	432-058-3Y	PUSH SWITCH SKPS-2210C	1	SW102

No.	Part No.	Part name & Description	Q'ty	Ref.
28	533-94M-BA	MAIN BODY ASS'Y	1	
29	533-94M-PA	MAIN PCB AUTO ASS'Y	1	
30	060-101-6Z	CHIP RESISTOR 100 1/10W 5% T 2012	4	R127.139.152.447
31	060-102-7Z	CHIP RESISTOR 1K 1/10W 5% T 2012	15	R5.16.18.34.37.102.105.106.112 .125.226.412.416.425.719
32	060-103-8Z	CHIP RESISTOR 10K 1/10W 5% T 2012	8	R7A.44.134.221.276.305.444.446
33	060-104-9Z	CHIP RESISTOR 100K 1/10W 5% T 2012	8	R8.29.157.406.409.411.415.438
34	060-105-0Z	CHIP RESISTOR 1M 1/10W 5% T 2012	1	R135
35	060-123-6Z	CHIP RESISTOR 12K 1/10W 5% T 2012	3	R3.30.445
36	060-151-1Z	CHIP RESISTOR 150 1/10W 5% T 2012	2	R229.313
37	060-152-2Z	CHIP RESISTOR 1.5K 1/10W 5% T 2012	3	R211.218.421
38	060-153-3Z	CHIP RESISTOR 15K 1/10W 5% T 2012	4	R35.55.212.223
39	060-154-4Z	CHIP RESISTOR 150K 1/10W 5% T 2012	2	R26.301
40	060-181-8Z	CHIP RESISTOR 180 1/10W 5% T 2012	1	R12
41	060-182-9Z	CHIP RESISTOR 1.8K 1/10W 5% T 2012	1	R38
42	060-183-0Z	CHIP RESISTOR 18K 1/10W 5% T 2012	1	R47
43	060-221-1Z	CHIP RESISTOR 220 1/10W 5% T 2012	10	R103.153.302.711.712.713.714. 715.716.717
44	060-222-2Z	CHIP RESISTOR 2.2K 1/10W 5% T 2012	7	R28.113.201.219.408.720.721
45	060-223-3Z	CHIP RESISTOR 22K 1/10W 5% T 2012	7	R9.10.41.126.145.162.277
46	060-224-4Z	CHIP RESISTOR 220K 1/10W 5% T 2012	1	R156
47	060-229-9Z	CHIP RESISTOR 2.2 1/10W 5% T 2012	1	R15
48	060-272-7Z	CHIP RESISTOR 2.7K 1/10W 5% T 2012	2	R17.151
49	060-273-8Z	CHIP RESISTOR 27K 1/10W 5% T 2012	3	R4.154.208
50	060-332-8Z	CHIP RESISTOR 3.3K 1/10W 5% T 2012	2	R202.232
51	060-333-9Z	CHIP RESISTOR 33K 1/10W 5% T 2012	6	R43.147.149.181.414.436
52	060-392-2Z	CHIP RESISTOR 3.9K 1/10W 5% T 2012	1	R278

INTEK

Model No: 3394	Title	Drawring No:
Customer :	M-110 Plus	Rev,Date:

No.	Part No.	Part name & Description		Q'ty	Ref.
53	060-393-3Z	CHIP RESISTOR	39K 1/10W 5% T 2012	4	R39.407.437.442
54	060-470-9Z	CHIP RESISTOR	47 1/10W 5% T 2012	2	R27.306
55	060-471-0Z	CHIP RESISTOR	470 1/10W 5% T 2012	4	R36.109.213.311
56	060-472-1Z	CHIP RESISTOR	4.7K 1/10W 5% T 2012	7	R40.42.144.236.303.304.315
57	060-473-2Z	CHIP RESISTOR	47K 1/10W 5% T 2012	21	R2.11.19.21.22.23.25.31.32.33. 101.146.271.272.273.274.435. + 443.461.13.45
58	060-474-3Z	CHIP RESISTOR	470K 1/10W 5% T 2012	1	R138
59	060-475-4Z	CHIP RESISTOR	4.7M 1/10W 5% T 2012	1	R434
60	060-561-8Z	CHIP RESISTOR	560 1/10W 5% T 2012	1	R148
61	060-563-0Z	CHIP RESISTOR	56K 1/10W 5% T 2012	1	R413
62	060-681-3Z	CHIP RESISTOR	680 1/10W 5% T 2012	1	R136
63	060-682-4Z	CHIP RESISTOR	6.8K 1/10W 5% T 2012	2	R137.405
64	060-683-5Z	CHIP RESISTOR	68K 1/10W 5% T 2012	1	R441
65	060-822-4Z	CHIP RESISTOR	8.2K 1/10W 5% T 2012	2	R20.439
66	130-A13-2Y	CHIP CERAMIC	0.0012UF GRM40 X7R122K 50V PT	1	C316
67	130-A17-6Y	CHIP CERAMIC	0.001UF GRM40 X7R102K 50V PT	6	C54.115.144.221.226.446
68	130-170-0Y	CHIP CERAMIC	0.1UF GRM40 Y5V104Z 25V PT	16	C8.17.29.36.53.122.127.128.136 .142.208.215.451.453.458.500A
69	130-172-2Y	CHIP CERAMIC	0.01UF GRM40 X7R103K 50V PT	38	C10.22.25.26.38.39.40.43.47.49 .50.102.112.120.129.137.138. + 139.147.149.217.227.231.234. 236.241.256.302.304.308.409. 424.427.434.438.443.531.532
70	130-263-1Z	CHIP CERAMIC	0.022UF CM21 X7R223K 50V AT	4	C27.37.152.306
71	130-314-5Y	CHIP CERAMIC	0.033UF GRM40 X7R333K 50V PT	1	C59

INTEK

Model No: 3394	Title	Drawring No:
Customer :	M-110 Plus	Rev,Date:

No.	Part No.	Part name & Description	Q'ty	Ref.
72	130-424-0Y	CHIP CERAMIC 0.047UF GRM40 X7R473K 50V PT	11	C19.35.135.141.143.145.222.248 .314.322.323
73	130-602-4Y	CHIP CERAMIC 0.0068UF GRM40 X7R682K 50V PT	1	C454
74	130-606-8Y	CHIP CERAMIC 0.068UF GRM40 X7R683K 50V PT	3	C42.411.455
75	131-027-0Y	CHIP CERAMIC 100PF GRM40 COG101J 50V PT	7	C250.251.252.253.414.418.423
76	131-039-1Y	CHIP CERAMIC 10PF GRM40 COG100C 50V PT	8	C4.5.6.28.31.114.417.425
77	131-089-7Y	CHIP CERAMIC 1UF GRM40 Y5V105Z 16V PT	1	C57
78	131-107-9Y	CHIP CERAMIC 120PF GRM40 COG121J 50V PT	1	C325
79	131-529-7Y	CHIP CERAMIC 150PF GRM40 COG151J 50V PT	1	C317
80	131-816-6Y	CHIP CERAMIC 18PF GRM40 COG180J 50V PT	1	C51
81	132-012-1Y	CHIP CERAMIC 20PF GRM40 COG200J 50V PT	2	C16.118
82	132-216-9Y	CHIP CERAMIC 22PF GRM40 COG220J 50V PT	1	C413
83	132-220-2Y	CHIP CERAMIC 220PF GRM40 COG221J 50V PT	3	C313.324.338
84	132-710-8Y	CHIP CERAMIC 270PF GRM40 COG271J 50V PT	1	C412
85	132-714-2Y	CHIP CERAMIC 27PF GRM40 COG270J 50V PT	2	C117.254
86	133-339-2Y	CHIP CERAMIC 330PF GRM40 COG331J 50V PT	2	C327.334
87	133-611-7Y	CHIP CERAMIC 36PF GRM40 COG360J 50V PT	1	C421
88	133-925-1Y	CHIP CERAMIC 390PF GRM40 COG391J 50V PT	1	C315
89	133-932-7Y	CHIP CERAMIC 39PF GRM40 COG390J 50V PT	3	C301.303A.428
90	134-719-7Y	CHIP CERAMIC 0.0047UF GRM40 X7R472K 50V PT	1	C146
91	134-722-1Y	CHIP CERAMIC 47PF GRM40 COG470J 50V PT	3	C52.326.328
92	134-761-4Y	CHIP CERAMIC 470PF GRM40 COG471J 50V PT	1	C333
93	135-613-9Y	CHIP CERAMIC 56PF GRM40 COG560J 50V PT	4	C41.101.255.337
94	136-005-5Y	CHIP CERAMIC 6PF GRM40 COG060D 50V PT	2	C422.426
95	136-811-6Y	CHIP CERAMIC 680PF GRM40 COG681J 50V PT	2	C3.457
96	136-816-5Y	CHIP CERAMIC 68PF GRM40 COG680J 50V PT	2	C21.318
97	138-210-3Y	CHIP CERAMIC 82PF GRM40 COG820J 50V PT	3	C307.331.447

No.	Part No.	Part name & Description	Q'ty	Ref.
98	202-085-9	TRANSISTOR KRC101S	3	Q10.406.407
99	202-095-8Z	TRANSISTOR KRC104SND	7	Q5.9.11.109.202.209.212
100	202-106-5	TRANSISTOR KTA1504SY	5	Q1.2.205.208.213
101	202-112-0Y	TRANSISTOR STC2412G	12	Q3.4.6.8.104.108.112.114.115.207.211.215
102	202-153-7	TRANSISTOR KTC3880SY	8	Q107.111.110.301.302.408.411.412
103	202-155-9Y	TRANSISTOR(BRT) SRA2205S	1	Q117
104	202-183-4	FET KTK211GR	3	Q102.105.106
105	221-460-5	I.C PLL(DUAL) BU2630F	1	IC6
106	221-854-8	I.C EEPROM 24LLC02-A	1	IC4
107	221-885-4	IC MCU (OTP) EFHP5830AD	1	IC3
108	222-018-5A	I.C KIA324F-EL	1	IC2
109	223-116-5	I.C FM IF MC3361DR2	1	IC1
110	242-024-6	DIODE VARIVAP CHIP KDV251S	2	D402.403
111	243-019-7Z	DIODE 1N4148	14	D2.3.4.5.6.8.101.102.103.104.203.407.413.414
112	243-049-4	DIODE SI CHIP KDS226	1	D111
113	4A1-200-B	P.C.B ASS'Y 197 X 156 X 1.6T XPC-94HB 1/0	1	
114	411-391-B	P.C.B MAIN 166 X 128 X 1.6T XPC-94HB 1/0	1	
115	411-839-B	P.C.B LCD 130 X 30 X 1.6T XPC-94HB 1/0	1	
116	533-94M-PM	MP MANUAL ASS'Y	1	
117	019-479-8Z	METAL OXIDE RESISTOR4.7 2W 5% ST	1	R207
118	030-100-6Z	FILM RESISTOR 10 1/ 2W 5% ST MINI	1	R225
119	030-101-7Z	FILM RESISTOR 100 1/ 2W 5% ST MINI	2	R24.178
120	030-229-0Z	FILM RESISTOR 2.2 1/ 2W 5% ST MINI	1	R314
121	030-479-3Z	FILM RESISTOR 4.7 1/ 2W 5% ST MINI	1	R312

No.	Part No.	Part name & Description	Q'ty	Ref.
122	061-205-2	RESISTOR SEMIFIXED 2KB PC805M H 8DIA	2	RV201.401
123	061-206-3	RESISTOR SEMIFIXED 20KB PC805M H 8DIA	1	RV1
124	061-508-8	RESISTOR SEMIFIXED 50KB PC805M H 8DIA	1	RV2
125	098-201-2	THERMISTOR DISK 200 OHM 15%:KC5B120L	1	TH102
126	098-501-3	THERMISTOR DISK 500 KC5C150L	2	TH1.2
127	100-101-9T	ELECT CAPACITOR 0.1UF 50V 20% 5X11 2.5PT	2	C13.433
128	100-405-4T	ELECT CAPACITOR 0.47UF 50V 20% 5X11 2.5PT	1	C2
129	101-007-3T	ELECT CAPACITOR 1UF 50V 20% 4X7 2.5PT	3	C12.448.452
130	101-012-7T	ELECT CAPACITOR 10UF 16V 20% 5X11 2.5PT	14	C9.23.32.33.55.134.206.232.235 .238.239.431.436.461
131	101-117-9	ELECT CAPACITOR 1000UF 16V 20% 10X16	3	C11.15.213
132	101-119-1	ELECT CAPACITOR 100UF 16V 20% 6.3X7	2	C228.237
133	102-207-2T	ELECT CAPACITOR 2.2UF 50V 20% 5X11 2.5PT	1	C24
134	102-210-4T	ELECT CAPACITOR 22UF 16V 20% 5X11 2.5PT	1	C429
135	102-299-5	ELECT CAPACITOR 220UF 16V 20% 6.3X11	4	C14.212.216.233
136	103-313-9T	ELECT CAPACITOR 33UF 16V 20% 5X11 2.5PT	1	C48
137	103-339-3T	ELECT CAPACITOR 3.3UF 50V 20% 4X7 2.5PT	2	C107.108
138	104-771-4T	ELECT CAPACITOR 47UF 16V 20% 5X11 2.5PT	6	C1.18.56.58.211.437
139	130-227-9R	DISK CERAMIC 0.022UF DD350257Y5V223M50V 794	1	C201
140	131-510-9X	DISK CERAMIC 150PF NPO K% 50V	1	C321
141	172-015-6W	DIP TRIMMER 20PF CVN620	1	CT201
142	204-016-7	TRANSISTOR 2SC2314(E)	1	Q303
143	241-004-3X	DIODE ZENER 1N5237BST	1	DZ201
144	241-046-1Z	DIODE ZENER 1N5231B 5.1V1/2W	1	DZ1
145	241-263-0	DIODE ZENER 1N5232BST	1	DZ401
146	245-015-3X	DIODE RECTIFIER 1N4004	2	D202.531
147	260-485-5V	CRYSTAL HC49U 10.240M -30 30PM 32P FUND	1	X901
148	263-485-5	CRYSTAL OSCILLATOR 32.768K -10 20PPM 12.5PF	1	X101

No.	Part No.	Part name & Description	Q'ty	Ref.
149	270-007-0W	FILTER CERAMIC LTW455HT	1	CF1
150	271-030-5Z	FILTER CRYSTAL HC49/T (10.695M)	1	XF101
151	300-136-3W	TRANSFORMER LE119-H019	1	CH501
152	300-159-4Z	TRANSFORMER (MOD.) EI-24	1	T201
153	310-022-6	COIL RF CHOKE 10UH CORE	1	L601
154	310-291-2Z	COIL AXIAL 6.8UH:TCEC-6R8K	2	L1.306
155	310-296-7	COIL SPRING 6X0.8X5.5T:R 0.225UH	1	L308
156	310-297-8	COIL SPRING 2.5X0.8X7T:R 0.11UH	1	L304
157	310-301-8	COIL CHOKE 6UH BOBBIN CORE	1	L201
158	310-316-6	COIL AXIAL 0.47UH:LAL03TBR47K	1	L2
159	310-347-0Z	COIL SPRING 5.2X0.7X7T:R	1	L313
160	310-407-1	COIL SPRING 5X0.6X13.5T:R	1	L307
161	310-751-1	COIL SPRING 4X0.5X7T:R	1	L311
162	310-811-2	COIL SPRING 3.4X0.55X8.5T:R	1	L312
163	320-276-2Y	COIL IFT DET R4251-AHK7-854462	1	L104
164	320-318-7Z	COIL IFT Z73C-359	2	L301.302
165	320-380-2Y	COIL IFT 27MHZ LKSZ73DO-X000205-0	1	L4
166	320-576-3U	COIL IFT 10.7MHZ MAX RX	1	L103
167	320-580-6X	COIL IFT 16.5MHZ 82PF COIL VCO	1	L501
168	320-584-0	COIL IFT 455KHZ-B	1	L106
169	320-585-1Z	COIL IFT 27MHZ Z073I-1	1	L3
170	321-095-2	COIL IFT 27MHZ RX (7RC)	1	L102
171	420-705-1Z	JACK DC TC38-078-01	1	J101
172	431-249-7	SW SLIDE SKS-2301U	1	SW4
173	431-253-0	SLIDE SWITCH SKS-2201U	1	SW3
174	450-417-3Y	VR 10KC:15SK 161S	1	VR108
175	450-604-5Z	VR 50KA:RS1610N-15KQB1-15A50K	1	VR102

176	533-94P-A	PACKING ASS'Y		1	
177	533-94W-MA	WIRE MIC ASS'Y		1	
178	427-045-6	WIRE	1007 AWG 26(7/0.16) YEL	0.06	MIC(+) --- SW 0.5:0.5
179	427-046-7	WIRE	1007 AWG 26(7/0.16) GRN	0.06	MIC(-) --- SW 0.5:0.5
130	533-94W-MP	WIRE MAIN PCB ASS'Y		1	
131	427-001-6	WIRE	1007 AWG 24(1/0.51) BLK	0.2	SW RX --- SW RX 1.5:1.5
132	427-003-8	WIRE	1007 AWG 24(1/0.51)RED	0.22	MAIN ON/OFF1 --- VR102 1.5:0.5
133	427-004-9	WIRE	1007 AWG 24 (1/0.51) ORG	0.11	MAIN GND --- VR108 1.5:0.5
134	427-005-0	WIRE	1007 AWG 24 (1/0.51) YEL	0.11	MAIN VOL1 --- VR102 1.5:0.5
135	427-006-1	WIRE	1007 AWG 24 (1/0.51) GRN	0.11	MAIN GND --- VR108 1.5:0.5
136	427-007-2	WIRE	1007 AWG 24 (1/0.51) BLU	0.11	MAIN GND --- VR102 1.5:0.5
137	427-008-3	WIRE	1007 AWG 24 (1/0.51) VIO	0.11	MAIN SQ --- VR108 1.5:0.5
138	427-009-4	WIRE	1007 AWG 24(1/0.51) GRY	0.13	MAIN VOL2 --- VR102 1.5:0.5
139	427-010-4	WIRE	1007 AWG 24(1/0.51) WHT	0.15	MAIN ON/OFF2 --- VR102 1.5:0.5
140	427-045-6	WIRE	1007 AWG 26(7/0.16) YEL	0.15	MAIN PCB (+) --- SPK(+) 1.5:0.5
141	427-046-7	WIRE	1007 AWG 26(7/0.16) GRN	0.15	MAIN PCB (-) --- SPK(-) 1.5:0.5

VOLTAGE CHART

TRANSISTOR

REF	PIN	TX	RX	REF	PIN	TX	RX
Q1	E	4.5	4.5	Q105	E	0	0
KTA1504	C	2.5	2.5	KTK211	C	0	1
	B	4.3	4.3		B	0	5.4
Q2	E	4.5	4.5	Q106	E	0	0
KTA1504	C	2.5	2.5	KTK211	C	0	1
	B	4.3	4.3		B	0	5.4
Q3	E	4.5	4.5	Q107	E	0	0
STC2412	C	9	9	KTC3880	C	0	7
	B	5.1	5.1		B	0	0.8
Q4	E	5	5	Q108	E	0	0
STC2412	C	11	11	STC2412	C	0	6.2
	B	5.6	5.6		B	0	0.7
Q5	E	0	0	Q109	E	0	0
KRC104	C	0	0	KRC104	C	0	0
	B	4.5	4.5		B	4.5	4.5
Q6	E	0	0	Q110	E	0	0.4
STC2412	C	0	0	KTC3880	C	0	3.3
	B	0	0		B	0	0.9
Q8	E	0	0	Q111	E	0	0
STC2412	C	0	0	KTC3880	C	0	7
	B	0	0		B	0	0.7
Q9	E	0	0	Q112	E	0	0
KRC104	C	0	0	STC2412	C	0	0
	B	4.5	4.5		B	0.6	0
Q10	E	0	0	Q114	E	0	0
KRC101	C	0	0	STC2412	C	0.8	0
	B	2.8	2.8		B	0	
Q11	E	0	0	Q115	E	0	0
KRC104	C	0	0	STC2412	C	0	0
	B	0	0		B	0	0
Q102	E	0	0	Q117	E	0.6	
KTK211	C	0	1	SRA2205	C	0	0
	B	0	6.9		B	0	
Q104	E	0	0	Q202	E	0	0
STC2412	C	0	0	KRC104	C	0	0
	B	0	0		B	5	5

TRANSISTOR

REF	PIN	TX	RX	REF	PIN	TX	RX
Q205	E	3.2	0	Q304	E	0	0
KTA1504	C	0	0	2SC2078	C	8.9	0
	B	2.6	0		B	0	0
Q207	E	0	7	Q406	E	0	0
STC2412	C	8	8	KRC101	C	0	0
	B	0	7.8		B	7.8	0
Q208	E	8	8	Q407	E	0	0
KTS1504	C	8	0	KRC101	C	0	0
	B	7.1	7.8		B	0	0
Q209	E	0	0	Q408	E	4	4
KRC104	C	0	7	KTC3880	C	7	7
	B	5	0		B	4.7	4.7
Q211	E	8	8	Q411	E	0	0
STC2412	C	11.5	12.6	KTC3880	C	3.3	3.3
	B	8.6	8.6		B	0	0
Q212	E	6.6	3.6	Q412	E	0	0
KRC104	C	10.7	12.4	KTC3880	C	3.3	3.3
	B	8	0		B	0.7	0.7
Q213	E	11.4	12.4		E		
KTA1504	C	11	0		C		
	B	11	12.4		B		
Q214	E	12.4	12.8		E		
KTB1367	C	10.8	0		C		
	B	11.7	12.4		B		
Q215	E	7.1	7.1		E		
STC2412	C	8	8		C		
	B	7.8	7.8		B		
Q301	E	1.1	0		E		
KTC3880	C	6.7	0		C		
	B	1.9	0		B		
Q302	E	1	0		E		
KTC3880	C	7.8	0		C		
	B	0.6	0		B		
Q303	E	0	0		E		
2SC2314	C	8.2	0		C		
	B	0	0		B		

IC6 BU2630

PIN	TX	RX	PIN	TX	RX
1	2.1	2.1	9	0	0
2	0	0	10	5	5
3	0	0	11	2.2	2.2
4	0	0	12	0	0
5	0	0	13	0	0
6	0	0	14	1.6	2
7	0	0	15	5	5
8	0	0	16	1.7	1.7

IC4 24LLC02A

PIN	TX	RX	PIN	TX	RX
1	0	0	5	0	0
2	0	0	6	5	5
3	0	0	7	0	0
4	0	0	8	5	5

IC2 KIA324

PIN	TX	RX	PIN	TX	RX
1	3.2	0	8	0	0
2	3.5	0	9	0	0
3	3.5	0	10	0	0
4	7.7	0	11	0	0
5	4	0	12	0	0
6	4.2	0	13	0	0
7	4.2	0	14	6.5	0

IC1 MC3361

PIN	TX	RX	PIN	TX	RX
1	0	6.5	9	0	2.5
2	0	6.1	10	0	0
3	0	6	11	0	5.6
4	0	6.5	12	0	0
5	0	6.1	13	0	6.4
6	0	6.1	14	0	0
7	0	6.1	15	0	0
8	0	6.5	16	0	6.5

IC3 EFHP5830AD

PIN	TX	RX	PIN	TX	RX
1	0	0	23	0	0
2	0	0	24	5	5
3	0	0	25	5	0
4	0	0	26	0	0
5	0	0	27	5	5
6	0	0	28	0	0
7	5	5	29	0	0
8	1	1	30	5	5
9	0	0	31	5	5
10	5	5	32	5	5
11	5	0	33	5	5
12	0	5	34	0	5
13	0	0	35	2.8	2.8
14	5	5	36	0	0
15	5	5	37	0	0
16	0	0	38	2.7	2.7
17	0	0	39	5	5
18	2.4	2.4	40	2.7	2.7
19	2.5	2.5	41	2.7	2.7
20	5	0	42	2.7	2.7
21	5	5	43	2.7	2.7
22	5	5	44	5	5

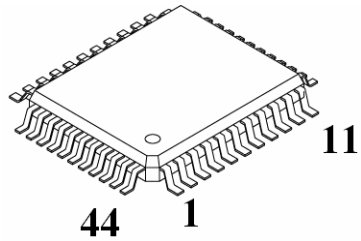
DIODE

REF	PIN	TX	RX	REF	PIN	TX	RX
D2	A	3.2	0	D103	A	0	6
1N4148	K	5	5	1N4148	K	0	5.4
D3	A	0	0	D104	A	0	6
1N4148	K	0.7	0	1N4148	K	0	5.4
D4	A	1.1	0	D203	A	2.6	0
1N4148	K	0	0	1N4148	K	9	0
D5	A	1	1	D402	A	0	0
1N4148	K	0	0	KDV251	K	5	5
D6	A	0	0	D403	A	0	0
1N4148	K	0	0	KDV251	K	0	0
D8	A	0	0	D407	A	1.8	0
1N4148	K	0	0	1N4148	K	5	0
D101	A	0	0	D413	A	0	0
1N4148	K	0	0	1N4148	K	0	0
DZ1	A	0	0	DZ201	A	0	0
	K	5	5		K	8.6	8.6
DZ401	A	0	0				
	K	5.6	5.6				

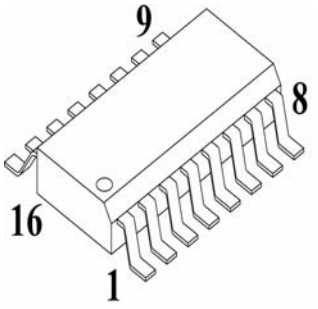
SEMICONDUCTOR LEAD IDENTIFICATION
AND IC INTERNAL CONNECTIONS

INTERATED CIRCUITS

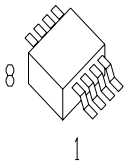
IC3 EFHP5830AD



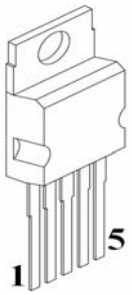
BU2630F MC 3361



IC9 : 24LLC02
8 PIN

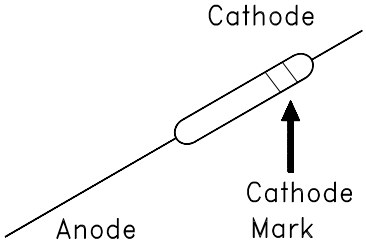


IC104 : UTC TDA2003

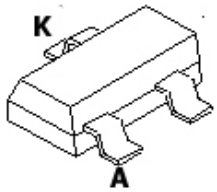


DIODES

1N4004 .1N4148 .1N5232
1N5404 .1N5237

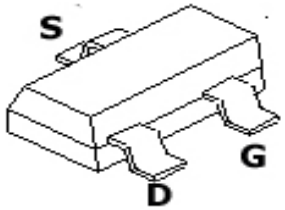


KDV251



TRANSISTORS

KTK211



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KTC3876, KTC3880
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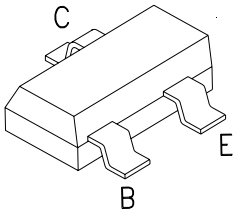
STG2412G



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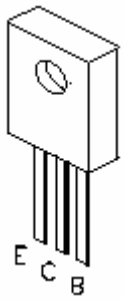

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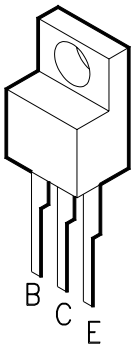
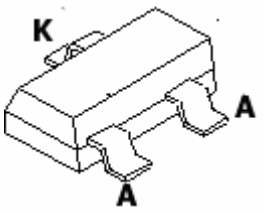
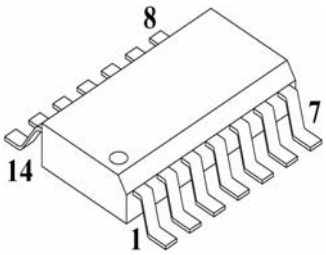


KDS184 KIA324



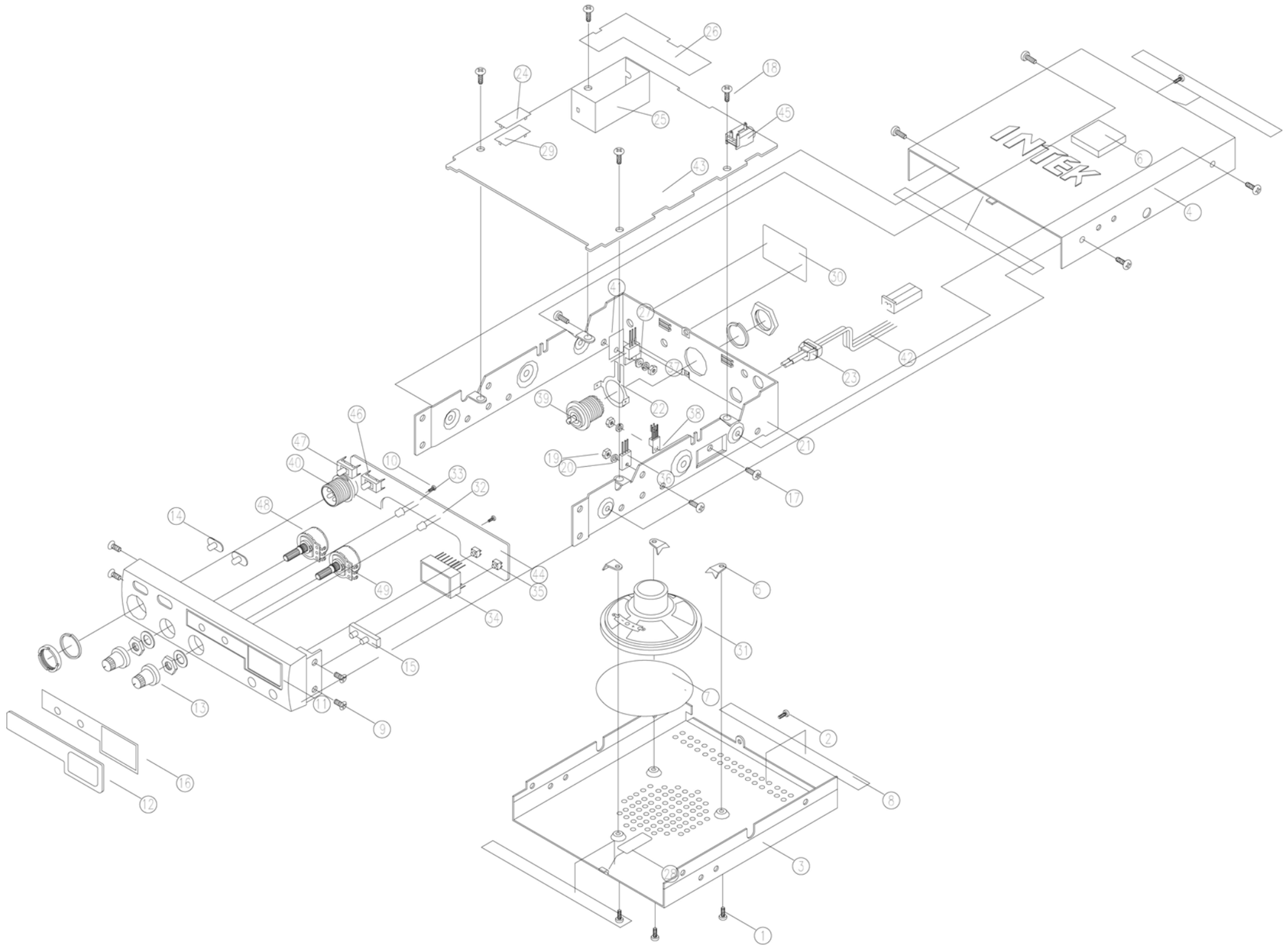


Model M-110 plus Explode view part list

No.	Part No.	Part name & Description	Q'ty	Ref.	Remark
1.	633-082	(+)TAP TITE SCREW BH3X6 BLK	7	SPEAKER:3 UP.BO COVER	
2.	633-152	(+)TAP TITE SCREW BH3X4-3S BLK	2	REAR COVER:2	
3.	719-062-A	COVER BOTTOM SECC+PVC T0.75	1		
4.	719-063-I	UPPER COVER SECC+PVC T0.75	1		
5.	730-015-A	HOLDER(SPK) EGI T1 USCOATING	3	SPK MTG	
6.	891-590	CUSHION 25X25XT5 RUBB.SP0.BLK STI	1	UP.COVER & PCB	
7.	901-226	FELT &65XT0.3 FELT BLK	1		
8.	905-505	FELT 10X130XT0.5 FELT STIC.	4		
9.	611-095	(+)MACHINE SCREW(FH)2.6X5 ZN-PLAT	4	ESC+MAIN BODY MTG	
10.	621-131	(+)TAPPING SCREW(BH)2.6X6-2S ZN-PLAT	2	ESC+SUB PCB MTG	
11.	801-820	E.S.C ABS 94HB BLACK COLOR	1		
12.	814-552	WINDOW ACRYL CLEAR	1		
13.	826-143	KNOB VOL ABS 94HB BLK	2		
14.	826-459	KNOB ABS 94HB BLK	2		
15.	896-482	KEY PAD SILICONE RUBBER , GRAY CO	1		
16.	907-562	TAPE WINDOW 3M 9448HK T0.16	1		
17.	613-332	(+)MACHINE SCREW(BH)3X10 ZN-PLAT	3	IC:1,TR:2	
18.	623-265	(+)TAPPING SCREW(BH)3X6-2S ZN-PLAT	4	MAIN PCB:4	
19.	651-024	NUT SS41 M3-1S ZN-PLAT	3	IC:1,TR:2	
20.	662-305	WASHER (SPRING) M3 ZN-PLAT	3	IC:1,TR:2	
21.	702-425-C	MAIN BODY EGI US COATING T1.0	1		
22.	732-560	HOLDER(ANT MTG) SPTE T0.3	1		
23.	750-039-A	CORD STOPPER P.P BLK	1		
24.	771-530	SHIELD PLATE SPTE T0.3	1		
25.	771-710-A	SHIELD PLATE SPTE T0.3	1		
26.	772-594	SHIELD PLATE TIN PLATE T0.4	1		
27.	853-105	BUSHING NYLON66+GLASS	1	FOR TR MTG	
28.	901-794-A	FELT 8X45XT0.3 FELT STIC.ALAN4	1		
29.	905-685-A	INSULATION PLATE INSULATION PAPER T0.25	1		
30.	95B-009-E	NAME LABEL POLYESTER 40 X 27	1		
31.	420-128-4Z	SPEAKER NP-250-2 8 OHM 2W 66MM	1	SPK	
32.	251-027-7X	LED LAMP LTL-1CHG GREEN	1	LED1	
33.	251-052-9Z	LED LAMP LTL-16KE RED 5V 100MW	1	LED2	
34.	252-016-2	LED DISPLAY LTD-482LLC GRN	1	LCD1	
35.	436-059-7Z	SW TACT TM115AP	2	SW1.2	
36.	202-066-2	TRANSISTOR KTB1367	1	Q214	
37.	204-010-1	TRANSISTOR 2SC2078(E)	1	Q304	
38.	221-889-8	AUDIO POWER AMPLIFIEUTC TDA2003(V) (TO-	1	IC104	
39.	421-046-7	CONNECTOR CH-239(A) SW-1229	1	J103	

No.	Part No.	Part name & Description	Q'ty	Ref.	Remark
40.	421-559-4A	CONNECTOR SCN-16-4 PCB(R)	1	CON1	
41.	440-020-4	MICA 0.1T:15X13 MICA FOR TR	1	MICA	
42.	504-734-Z	POWER CORD ASS'Y	1		
43.	411-391-B	P.C.B MAIN 166 X 128 X 1.6T XPC-94HB	1		
44.	411-839-B	P.C.B LCD 130 X 30 X 1.6T XPC-94HB	1		
45.	420-705-1Z	JACK DC TC38-078-01	1	J101	
46.	431-249-7	SW SLIDE SKS-2301U	1	SW4	
47.	431-253-0	SLIDE SWITCH SKS-2201U	1	SW3	
48.	450-417-3Y	VR 10KC:15SK 161S	1	VR108	
49.	450-604-5Z	VR 50KA:RS1610N-15KQB1-15A50K	1	VR102	

Model No: 3394	Title	Drawring No:
Customer :	M-110 Plus	Rev,Date:



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For Stage:	Release Date:	**Page**: 53 / 53